REMARKS

This communication is in response to the Action of April 18, 2005. In that Action, claims 1 through 24 were rejected but with claims 3, 6 through 9, 12 through 14, 16, 17, 20 and 22 through 24 being indicated to be allowable if rewritten to correct wording deficiencies therein and to be put in independent form.

The applicants have amended claims 1, 3, 4, 5, 6, 8, 9, 12 through 14, 16, 18, 20, 21 and 23 to correct inadvertent errors therein and to clarify the meaning thereof along with changing the dependency of claim 14. In addition, the applicants have added claims 25 through 37 to more fully claim the present invention.

The Examiner first requires a more descriptive title for the invention which the applicants have provided by the above amendment.

The Examiner next rejects claims 1 through 24 under 35 U.S.C. § 112 as being indefinite in the phrase "said operating surface" used in claims 1, 4, 6, 9, 13 and 18 lacking a proper antecedent basis. The applicants believe that this rejection has been overcome by the above amendment.

The Examiner then rejects claims 1, 4, 5, 18, 19 and 21 under 35 U.S.C. § 102 as being anticipated by U.S. Patent 4,518,931 to Rauscher. The Examiner appears to contend that the Rauscher reference oscillator has a semiconductor material substrate with an amplifier provided thereon by its transistor 10, and also in having a transmission line element 32 coupled to the output of transistor 10 formed in a coupler with transmission line element 34 that is coupled to the input of transistor 10, thereby meets independent claim 1; and further, that substituting transmission line elements 54 and 56 for 32 and 34 thereby provides a transfer system to meet claim 18. With these contentions, the applicants must respectfully disagree.

A major difference between the Rauscher reference oscillator and the oscillators claimed in independent claims 1 and 18 of the present application is that the Rauscher reference oscillator cannot be a monolithic microwave integrated circuit as is required in claims 1 and 18 by the limitation in those claims of the substrate being a semiconductor material. To the contrary, the

statement in the Rauscher reference description concerning the substrate provided for the oscillator disclosed therein is found in column 8 at lines 63 through 65 where the substrate is clearly described as being formed of "TEFLON" which is a registered trademark for a commercially available polymerized substance that is well known not to be a semiconductor material. Thus, these rejected claims as filed already clearly distinguish over the Rauscher reference oscillator.

However, to further make clear the difference between what is claimed in independent claims 1 and 18 and disclosed in the Rauscher reference, they have been amended to indicate that the amplifier therein is formed at least in part in the semiconductor material. This cannot be the situation for the Rauscher reference transistor 10 as there is no indication there that a transistor can be formed in the polymerized substance sold under mark "TEFLON". Thus, the applicants respectfully submit that independent claims 1 and 18 are clearly distinguished from the Rauscher reference in claiming a monolithic microwave integrated circuit through having the substrates recited therein being used in forming amplifying devices.

In addition, the Rauscher reference cannot meet the requirements of independent claim 18 for the transfer system set forth therein on the further basis of having transmission line elements 54 and 56 present in the Rauscher reference oscillator to serve as the transfer system set out in this claim as argued by the Examiner. Since these elements are part of the biasing circuit in the Rauscher reference oscillator stated in that reference at column 7, line 29 to be designed to avoid having energy at the oscillator frequency flowing in these circuits in avoiding dissipation thereof, they can hardly serve to couple that very energy in the feedback loop provided by that transfer system of claim 1 as the basis provided for the claimed system to oscillate. This avoidance of oscillator frequency energy flowing in these circuits is achieved by arranging to have a short circuit at the ends of transmission line elements 54 and 56 connected to terminals 62 and 64 in the Rauscher reference, terminals to which voltage sources are also connected which also serve as oscillation frequencies short circuits for that oscillator. Also, the applicants have in addition amended claim 18 to make clear there is not any significant electromagnetic coupling at the operating major surface as is required for the directional couplers in the Rauscher reference.

Furthermore, in connection with claim 4, both the coupler system and the transfer system are required to be present in series with one another through having the input conductor of the transfer system coupled to the output conductor of the coupler. The resulting arrangement clearly cannot be met by the Rauscher reference oscillator in which input transmission line element 32 of the coupler alleged to be present in the Rauscher reference oscillator, and input transmission line element 54 of the transfer system also alleged to be present therein, are both connected on the output side of transistor 10 rather than the latter being connected to output transmission line element 34 of the alleged coupler. In these circumstances, the applicants respectfully submit that independent claims 1 and 18 are clearly allowable over the Rauscher reference, and so then also are the claims dependent thereon.

The Examiner thereafter rejects claims 2, 10, 11, 15, 19 and 21 under 35 U.S.C. § 103 as being obvious over the Rauscher reference taken in view of an article entitled "Low Phase-Noise PHEMT-Based MMIC VCOs for LMDS Applications" by A. Boudief et al. and published by the IEEE. The Examiner appears to contend that the Rauscher reference, as described above, meets these claims when taken in view of the Boudief et al. article indicating use of a gallium arsenide substrate in which pseudomorphic high electron mobility transistors are formed. Here, too, the applicants must respectfully disagree.

The Examiner essentially finds that the Boudief reference suggests forming the Rauscher reference oscillator as a monolithic microwave integrated circuit rather than as the hybrid integrated circuit actually disclosed. Note, however, that the Rauscher reference clearly states in column 5 beginning at line 18 the importance of the Rauscher reference oscillator coupling network in providing a feedback signal of proper amplitude and phase around the amplifier transistor to cause the desired fundamental frequency oscillation. In this context, edge-coupled parallel microstrip transmission line elements like 32 and 34 forming a directional coupler in the Rauscher reference oscillator have been chosen to provide that feedback signal in the coupling network there even though such couplers are well known to provide only relatively weak coupling between them. This electromagnetic coupling is well known to depend on the characteristic impedance of the elements

therein as determined in part by the substrate material parameters, and the coupler losses are well known to generally be the sum of the conductor and the dielectric substrate losses.

In these circumstances, there is no reason to believe that the Examiner's substitution of gallium arsenide semiconductor material substrate, based on the Boudief reference disclosure, for the TEFLON material substrate of the Rauscher reference oscillator will yield a operable feedback system that provides oscillating signal magnitudes therein. This is because gallium arsenide semiconductor material has a dielectric constant the is five or six times that of TEFLON, and a loss tangent that is an order of magnitude greater that of TEFLON. The losses in the signals alone transmitted through the Rauscher reference coupling network on a semiconductor material substrate, even without considering the effects on other coupler parameters, can very well result in a signal of too little magnitude to cause signal magnitude oscillation in the Rauscher reference system even though that system oscillates well on a lower loss TEFLON substrate.

The Boudief reference is instructive in this regard in choosing a series feedback configuration for its oscillator on a semiconductor material substrate to thereby avoid plural transmission line elements in the feedback path for transmitting its feedback signal. This is in contrast to, and teaches away from, the feedback loop of the Rauscher reference oscillator with its many transmission line elements which may well be feasible only on a low loss TEFLON substrate. Moreover, the Rauscher reference in column 8 at line 47 teaches use of a GaAs FET but still a GaAs substrate was not chosen as the basis for forming the entire oscillator disclosed therein, including a FET that then could have been conveniently fabricated in such a substrate, a circumstance certainly teaching away from the use of such a substrate for this oscillator. In these circumstances, the applicants respectfully submit that the Boudief reference does nothing to render obvious to one skilled in the art the operability of the Rauscher reference oscillator on a semiconductor substrate in its disclosed circuit form, and so provides no basis for rejecting these claims on the combination of those two references. Thus, the applicants respectfully submit that these claims are allowable over the Rauscher and Boudief references taken either alone or together.

In view of the foregoing, the applicants respectfully request that the Examiner reconsider these claims as amended, and further request that these claims be allowed as amended.

The Commissioner is authorized to charge any additional fees associated with this paper or credit any overpayment to Deposit Account 11-0982.

Any inquiries regarding this application should be directed to Theodore F. Neils at (612) 339-1863.

Respectfully submitted,

KINNEY & LANGE, P.A.

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By: _____

Theodore F. Neils, Reg. No. 26,316
THE KINNEY & LANGE BUILDING
312 South Third Street
Minneapolis, MN 55415-1002
Telephone: (612) 339-1863
Fax: (612) 339-6580

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